

PLEASANTVILLE COVERED BRIDGE

HAER No. PA-491

Pennsylvania Historic Bridges Recording Project - II
Spanning Little Manatawny Creek at Covered Bridge Rd. (State Rt. 1030)
Manatawny vic.
Berks County
Pennsylvania

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HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
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Washington, DC 20240

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(Manatawny Bridge)

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Location: Spanning Little Manatawny Creek at Covered Bridge Rd. (State Rt. 1030), Manatawny vicinity, Berks County, Pennsylvania.

USGS Quadrangle: Manatawny, Pennsylvania (7.5-minute series, 1973).

UTM Coordinates: 18/437260/4469875

Dates of Construction: 1852; altered 1856.

Designers / Builders: David Renno and Levi Marks, original construction; Jonathan Bitner, alterations.

Present Owner: Pennsylvania Department of Transportation.

Present Use: Vehicular bridge.

Significance: One of five remaining covered wooden bridges in Berks County, the Pleasantville Covered Bridge is a contributing resource in the National Register-listed Oley Township Historic District. It is distinctive for its two-phase construction: an arch-stiffened pony truss completed in 1852 and covered by a different builder in 1856. With its three sets of stiffening arches, the Pleasantville Covered Bridge is a unique adaptation of Theodore Burr's patented truss form.

Historian: Helen P. Ross, August 1998. Revised and expanded by Justin M. Spivey, March 2001.

Project Description: The Pennsylvania Historic Bridges Recording Project II was co-sponsored during the summer of 1998 by HABS/HAER under the general direction of E. Blaine Cliver, Chief; the Pennsylvania Department of Transportation, Bureau of Environmental Quality, Wayne W. Kober, Director; and the Pennsylvania Historical and Museum Commission, Brent D. Glass, Executive Director and State Historic Preservation Officer. The fieldwork, measured drawings, historical reports and photographs were prepared under the direction of Eric DeLony, Chief of HAER.

Introduction

The Pleasantville Covered Bridge is unusual because it was constructed in two phases by two different builders. Like many covered wooden bridges, the structure consists a multiple-king-post truss stiffened with arches, a form patented by Theodore Burr. Although some Burr arch-truss spans have two sets of arches, the Pleasantville Bridge has a rare third. Local carpenter and bridge builder David Renno built the bridge in 1852 on stone abutments constructed by Levi Marks. In its original configuration, the structure consisted of a multiple-king-post pony truss with two sets of arches. In 1856, the county commissioners contracted with Jonathan Bitner to enclose bridges at Earlville (demolished in 1938) and Pleasantville. Bitner erected walls on top of the pony trusses, built gable roofs, and added a third set of arches to each. A three-span pony truss bridge at Poplar Neck (demolished in 1917) was enclosed by a similar method in the 1860s.¹ Of the three Berks County bridges constructed in this way, the Pleasantville span is the only survivor.

The Pleasantville Covered Bridge is a contributing resource in the 15,000-acre National Register-listed Oley Township Historic District. Oley Township, in eastern Berks County, about ten miles east of Reading, remains an outstanding example of a rural Pennsylvania German farm community illustrating three centuries' worth of architectural and cultural heritage. In the period between 1820 and 1860, Oley Township experienced significant population growth, increasing by 600 people. On the eve of the Civil War, Oley Village, the township's social and business nucleus just two miles west of the bridge, included forty residences, a couple of schoolhouses, two shops, and various cottage industries. Elsewhere in the township, smaller hamlets sprouted at important crossroads. Pleasantville, located a quarter mile north of Little Manatawny Creek on present-day Covered Bridge Road, lent its name to the bridge. Throughout much of the nineteenth century and into the twentieth, the road was known as the Oley Turnpike, a privately financed toll road. The toll house, which functioned until 1927, remains northeast of the bridge. By virtue of its topographic isolation in Oley Valley, the township's agricultural character and rural quality of life have changed little since the mid-nineteenth century.²

¹ Fred J. Moll, "Berks County's Covered Bridges," *Historical Review of Berks County* 45, No. 1 (Winter 1979): 14, 29. The third set of arches may have been added at a later date, according to John R. Bowie and Richard I. Ortega, *Condition Assessment and Recommendations: Pleasantville Covered Bridge, SR 1030 over Manatawny Creek* (East Orange, N.J.: Cultural Resource Group, Louis Berger & Associates, 1995), 3, copy in bridge inspection file, BMS No. 06-1030-0080-0000, Pennsylvania Department of Transportation, Engineering District 5-0, Allentown, Pa.

² Phoebe L. Hopkins, "Oley Township Historic District," Berks County, Pennsylvania, National Register of Historic Places Registration Form, 1982, Section 7, p. 2, U.S. Department of the Interior, National Park Service, Washington, D.C.

Bridge Builders and Berks County

By the mid-nineteenth century, use of the covered wooden bridge form had surpassed that of stone arches, because timber was less expensive, easily obtained, and able to span greater lengths. Between 1812 and 1887, thirty-six covered wooden bridges were erected in Berks County, not counting those replaced after being destroyed by floods. The Burr arch-truss was the most widely used truss type in Berks County during this period.³ The type originated with Theodore Burr, whose arch-stiffened truss was the subject of U.S. patents issued in 1806 and 1817. The patents were destroyed in the U.S. Patent Office fire of 1836, however. The Burr arch-truss is distinguished by a multiple-king-post truss, with vertical posts, sandwiched between paired arches.⁴ It became an often-used solution for spanning lengths from fifty to one hundred feet. In 1980, seventeen of Pennsylvania's twenty-six state-owned covered bridges were Burr arch-trusses. Local craftsmen chose the Burr arch-truss because they were familiar with its construction and its ability to reduce deflections, permitting the spanning of wider streams.⁵

The Pleasantville Bridge was one of several built by Berks County after destructive flooding in 1850. County commissioners hired David Renno (1809-1890) to replace the Poplar Neck Bridge across the Schuylkill River in 1851. They turned their attention to rebuilding two crossings of Manatawny Creek early the following year, opening bids at their meeting on 2 February 1852. Renno was one of several local bridge builders to submit bids, and his came in lowest for both projects. He signed a contract two days later, agreeing to rebuild the Pleasantville Bridge in Oley Township for \$2,156 and the Earlville Bridge in Amity Township for \$1,645. The roofless pony truss spans were significantly less expensive than covered bridges of similar length, which averaged about \$5,000 at that time.⁶ Wooden bridges were typically covered to protect them from the weather, but a shortage of lumber caused by the flood made total rebuilding of these bridges an impossibility. Renno constructed multiple-king-post pony trusses with double Burr arches at both locations. It is unclear whether the county specified the truss configuration, as the original records have been lost during transfer of the Pleasantville Bridge from county, to township, to state ownership.⁷ Local stonemason Levi Marks built the high stone abutments at Pleasantville, perhaps incorporating lower parts of abutments from the previous span. Once the lumber shortage eased, the county commissioners contracted with

³ Bowie and Ortega, *Condition Assessment*, 1-2.

⁴ Vernon White, "Observations on the Burr Family of Trusses," *Covered Bridge Topics: Newsletter of Theodore Burr Covered Bridge Society of Pennsylvania* (Summer 1995): 11; cf. Joseph D. Conwill, "Burr versus Wernwag," *Covered Bridge Topics* (Spring 1997): 4.

⁵ Pennsylvania Department of Transportation, *Historic Highway Bridges in Pennsylvania* (Harrisburg: Pennsylvania Department of Transportation, 1986), 59, 64.

⁶ Fred J. Moll, "The Pleasantville Covered Bridge," *Historical Review of Berks County* 52, No. 2 (Spring 1987): 77-79.

⁷ Bowie and Ortega, *Condition Assessment*, 3-4.

Jonathan Bitner to enclose the Earlville and Pleasantville bridges in 1856. A prolific builder, Bitner constructed at least seven other covered wooden bridges in Berks County between 1851 and 1875.⁸

Description

The Pleasantville Covered Bridge spans Little Manatawny Creek, carrying the former Oley Turnpike, now Covered Bridge Road (State Route 1030), between Yellow House and Pleasantville. Fertile flood plains lie on either side of the stream, with a mill and several farmhouses grouped close to the bridge. The turnpike toll house is adjacent to the northeast. The bridge's length is 142'-0" from portal to portal, with a clear span of 126'-0" between abutments. Inside the bridge, the roadway clearances are 16'-7" wide and 11'-11" high. Sandstone abutments provide vertical support and resist the horizontal thrust of the stiffening arches. Flared wing walls, about 60'-0" long, retain the earth-fill approaches on either end. The abutment and wing walls were evidently unable to withstand the additional thrust of the 1856 addition to the bridge, and were subsequently covered with an additional layer of stone. The southwest wing wall collapsed in a 1985 flood, and the northwest wing wall met a similar fate in 1993.⁹ As of this writing, the bridge was closed pending a major rehabilitation.

The bridge's commemorative features include a white marble plaque reading "MANATAWNY / BERKS COUNTY BRIDGE / REBUILT 1856," along with the county commissioners' and Bitner's names, is set into the northeast parapet. A corresponding plaque with Marks' name, set into the southwest parapet, was carried away when the wing wall collapsed. There is evidence that a third plaque identifying Renno was originally mounted to the east pony truss at mid-span.¹⁰ It may have been moved to one of the portals in 1856, with Bitner's plaque mounted above the other, as was traditional for covered bridges. If so, Renno's plaque may have been lost after a backhoe destroyed part of the roof in 1950.¹¹ Bitner's plaque would then have been moved to the parapet when the roof was replaced.

Renno's 1852 pony truss, approximately 8'-0" deep, is stiffened by two sets of Burr arches. The lower set rises to just below the deck level; the upper set reaches the upper chord of the pony truss at mid-span. At each location, the truss is bolted between a pair of arch members, which are typically 6" wide and 16" deep and bear on the stone abutments. The lower chord consists of paired timbers, each 8" wide and 13" deep; the upper chord is a single 10" by 10" timber. Vertical king posts divide the truss into eighteen panels of varying width (7'-0" on average). Diagonal bracing is provided by 7" by 10" members that are shouldered into the king-

⁸ Fred J. Moll, "Wooden Bridge Builders of Berks County," typescript, n.d., prepared for the author.

⁹ Bowie and Ortega, *Condition Assessment*, 4-5.

¹⁰ Bowie and Ortega, *Condition Assessment*, figs. 5, 18.

¹¹ See Moll, "The Pleasantville Covered Bridge," 77-78.

posts and held in place by large iron spikes. On the side opposite the diagonal, each king-post has a 4" by 6" knee brace, inclined about 15 degrees from horizontal and mortised into the upper chord. Because of the deep shoulders cut into the king-posts, their effective cross-section is about 8" by 10". The upper chord is joined to the king-posts by mortise and tenon joints, fastened with 1"-diameter oak trenails. The king-posts project 9" below the lower chord, where they are clearly visible from the outside the bridge.¹²

The line between Renno's pony truss and Bitner's 1856 addition is marked by two distinct treatments of the exterior sheathing. Vertical tongue-and-groove wooden siding occurs below this line, with horizontal weather boards above. Bitner's work consists of post-and-beam walls, with 8" by 10" posts mortised into the pony truss's upper chord and supporting a top plate 10" wide and 8" deep. The walls added 8'-6" to the depth of the truss. Bitner divided his frame into fourteen bays that average nearly 9'-0" in width, with an additional 8'-0" bay extending past the truss on either end. (The end posts originally bore directly on the abutment, no doubt increasing the structure's exposure to rot and termites.) The different spacing of vertical elements reflects Bitner's intention to distribute the weight of the wall along the pony truss rather than directly transferring it into the king-post points. Pairs of downward knee braces, 4" by 6" timbers, occur at alternate posts. A third set of arches, 6" wide and 15-1/2" deep, is bolted to either side of the wall, reaching a height 16" short of the top plate. These arches are wedged between the original arches and the stone abutments at either end. Whereas the original arches were fastened by 3/4" hand-wrought iron bolts with coarse threads and odd-shaped beveled heads, the uppermost arches have square-headed bolts with much finer threads. The uppermost arches are also tied to the lower chords by four vertical 1-1/8"-diameter wrought-iron tie rods. The roof system was replaced in 1950, and currently consists of tied rafters supporting an asphalt shingle roof.¹³

The bridge's floor system incorporates an unusual detail, yet another pair of timber arches laid in the plane of the deck to provide lateral bracing. One arch springs from the west corners of the abutments to brace the midpoint of the east truss; the other does the opposite. This system appears in drawings for a patent issued to J. Snyder on 3 February 1834, although it is unclear whether the deck arches were among the claims, which were destroyed in the 1836 fire.¹⁴ On the Pleasantville Bridge, the arches are let into the transverse floor beams, which are attached to the king-posts some distance above the lower chord. The floor beams are currently stiffened by a system of wooden trussing, which may date from 1964 alterations to the bridge's deck. Spanning between the floor beams, longitudinal wooden stringers carry a double layer of planking. According to covered bridge historian Harry E. Mitchell, Jr., the second, longitudinal

¹² Description based on field measurements and Bowie and Ortega, *Condition Assessment*, 4-5.

¹³ Bowie and Ortega, *Condition Assessment*, 5.

¹⁴ Stott Anderson, "Covered Wooden Bridge Patents," Theodore Burr Covered Bridge Society of Pennsylvania *Portals* 3, No. 4 (Dec 1963).

layer of planking was typically installed on covered wooden bridges after the advent of automobile traffic. Both layers of planks were replaced on the Pleasantville Bridge in 1982.¹⁵

Conclusion

The Pleasantville Covered Bridge is an outstanding example of mid-nineteenth century bridge engineering. It is an artifact of an era when bridges were built to last, with builders crafting the members much larger than was actually necessary. The bridge's interlocking framework has been able to function for over one hundred and forty years, even after both abutments washed out. The bridge was closed to traffic in 1993, and rehabilitation work was in the planning phase as of this writing in 1998. Three major problems were identified: failure of the abutments, deterioration of wood in the end bearings, and bowing of the superstructure in the upstream direction (likely related to the abutment failure). The Pennsylvania Department of Transportation agreed to fund a historically sensitive rehabilitation of the bridge, in exchange for Berks County assuming maintenance responsibilities.¹⁶ Once this occurs, the Pleasantville Covered Bridge will return once again to county ownership.

¹⁵ Harry E. Mitchell, Jr., "The Covered Bridges of Berks County," *Historical Review of Berks County* 13, No. 1 (Oct. 1947): 4; cf. Moll, "Pleasantville Covered Bridge," 80.

¹⁶ Cultural Resource Group, *Pleasantville Covered Bridge*, 9; Mark Nemirow, "County Preserves Piece of Heritage," *Reading Eagle*, 9 June 1995.

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